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EXAMINER

KISS, ERIC B

ART UNIT	PAPER NUMBER
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2192

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/21/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/623,753	Applicant(s) SHAUL, HAYIM	
	Examiner Eric B. Kiss	Art Unit 2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-22 have been examined.

Information Disclosure Statement

2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper."

Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

3. The disclosure is objected to because of the following informalities: In applicant's "Cross-Reference to Related Applications," U.S. Prov. App. 60/406,113 appears to be incorrectly described as having been filed on September 18, 2002. This provisional application appears to have been filed on August 27, 2002. Appropriate correction is required.

The use of trademarks, such as LINUX, WINDOWS, and VTUNE, has been noted in this application. Trademarks should be capitalized wherever they appear (capitalize each letter or accompany each trademark with an appropriate designation symbol, e.g., TM or ®) and be accompanied by the generic terminology (use trademarks as adjectives modifying a descriptive noun).

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks. Further, it

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is noted that CELOXICA and QUICKLOGIC, (Specification at p. 7, line 13,) appear to be used to designate the companies themselves rather than being used as trademarks describing their products, and as such, the trademark symbol (*i.e.*, “™”) appears inappropriate (the company name is only a trademark where used to label the company’s goods or services).

Claim Objections

4. Claim 15 is objected to because of the following informalities: Claim 15 is missing a period at the end. Appropriate correction is required.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1-15 and 17-22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

A claim that requires one or more acts to be performed defines a process.

However, not all processes are statutory under 35 U.S.C. § 101. To be statutory, a claimed process must either: (A) result in a physical transformation for which a practical application is either disclosed in the specification or would have been known to a skilled artisan, or (B) be limited to a practical application which produces a useful, tangible, and concrete result. *See Diamond v. Diehr*, 450 U.S. 175, 183-84, 209 USPQ 1, 9 (1981) (quoting *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876)) (“A [statutory] process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state

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or thing The process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence.”). *See also In re Alappat*, 33 F.3d 1526, 1543, 31 USPQ2d 1545, 1556-57 (quoting *Diehr*, 450 U.S. at 192, [209 USPQ at 10]).

In *State Street*, the Federal Circuit examined some of its prior section 101 cases, observing that the claimed inventions in those cases were each for a “practical application of an abstract idea” because the elements of the invention operated to produce a “useful, concrete and tangible result.” *State St. Bank & Trust v. Signature Fin. Group*, 149 F.3d 1368, 1373-74, 47 USPQ2d 1596, 1601-02 (Fed Cir. 1998). For example, the court in *State Street* noted that the claimed invention in *Alappat* “constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it produced ‘a useful, concrete and tangible result’—the smooth waveform.” *Id.* Similarly, the claimed invention in *Arrhythmia* “constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it corresponded to a useful, concrete and tangible thing—the condition of a patient’s heart.” *Id.* (citing *Arrhythmia Research Tech. V. Corazonix Corp.*, 958 F.2d 1053, 22 USPQ2d 1033 (Fed. Cir. 1992)).

In determining whether the claim is for a “practical application,” the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result is “useful, tangible and concrete.” The Federal Circuit further ruled that it is of little relevance whether a claim is directed to a machine or process for the purpose of a § 101 analysis. *AT&T Corp. v. Excel Commc’ns*, 172 F.3d 1352, 1358, 50 USPQ2d 1447, 1451 (Fed. Cir. 1999).

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The methods of claims 1-15 and 17-22 are not limited to a practical application in that they do not necessarily produce a useful, tangible, and concrete result. Claim 16, although itself statutory (modifying a file is a tangible result), provides evidence that the method of claim 1 does not necessarily store the changes to the application as a tangible result, i.e., changing the application file. Claims 2-15 and 17-22 fail to remedy the deficiencies of claim 1. Note that claim 17 does not adequately describe any actual structural or functional change in "the memory" (which further lacks antecedent basis, see the rejection under 35 U.S.C. § 112, second paragraph, below) necessary to achieve a tangible result.

7. To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. § 101 (non-statutory) above are further rejected as set forth below in anticipation of Applicant amending these claims to place them within the four statutory categories of invention.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 14, 15, 17, and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 recites the limitations "the code" and "said code" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitations "the code" and "said code" in line 3. There is insufficient antecedent basis for this limitation in the claim.

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Claim 17 recites the limitation "the memory" in line 2. There is insufficient antecedent basis for this limitation in the claim. In the interest of compact prosecution, the examiner subsequently interprets claim 17 as reciting "a memory" for the purpose of further examination (note, however, that this applied interpretation does not address the issues raised under 35 U.S.C. § 101, as set forth above).

Claim 22 refers to, "The method of claim 23," which does not exist in the instant application. In the interest of compact prosecution, the examiner subsequently interprets claim 22 as being dependent from claim 21 (which provides the necessary antecedent basis for the limitations in the body of claim 22) for the purpose of further examination.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-5, 7, 9-13, and 16-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Thomas Kistler, "Continuous Program Optimization," 1999, Ph.D. thesis, Department of Information and Computer Science, University of California, Irvine, CA, (151 pages) (hereinafter "*Kistler*").

As per claim 1, *Kistler* discloses:

identifying hotspot functions in an application to accelerate (see, e.g., section 2.6, beginning on p. 38, describing hot spots);

identifying the hardware on which the application runs (see, e.g., pp. 14 and 17-18. describing "plug-in" profiling components, which enable applications to take full

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advantage on the hardware on which they run by providing hardware-specific interfaces to the profiling and optimization framework);

extracting the code of said hotspot functions from the application file (see, e.g., section 2.7, describing the replacement of code corresponding to optimization of hot spots);

changing the code of said hotspot functions extracted from application file to create new code (see, e.g., section 2.7, describing the replacing of code and data); and

changing the flow of said application to go through said new code (see, e.g., section 2.7, and in particular, p. 45, describing changing branches to old code to branches to the new code).

As per claim 2, *Kistler* further discloses said hotspot functions taking most of the processing time (see, e.g., section 2.5, describing the profiling metrics used to determine when to optimize code).

As per claim 3, *Kistler* further discloses said step of identifying hotspot functions using symbol information or debug information embedded in said application file to determine the boundaries of said functions (see, e.g., "Built-in Profiling Components," beginning on p. 34, describing the use of instrumenting profilers).

As per claim 4, *Kistler* further discloses said step of identifying hotspot functions using code patterns in said application to determine the boundaries of said hotspot functions (see, e.g., "Built-in Profiling Components," beginning on p. 34, describing the use of instrumenting profilers, including instrumenting basic block transitions).

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As per claim 5, *Kistler* further discloses said step of identifying hotspot functions choosing all said functions to be accelerated (see, e.g, section 2.6, describing how to decide when to optimize).

As per claim 7, *Kistler* further discloses said step of identifying hotspot functions further including the steps of:

running the program code (see, e.g, section 2.6);

checking the usage of each function (see, e.g, section 2.6); and

analyzing usage statistics of each function for selecting functions to accelerate (see, e.g, section 2.6).

As per claims 9 and 10, *Kistler* further discloses said step of identifying the hardware probing for peripheral hardware and designated acceleration boards on the computer (see, e.g., the introduction to chapter 2 on pp. 17-18, describing the optimization component plug-ins for peripherals and acceleration boards (e.g., graphics accelerators)).

As per claim 11, *Kistler* further discloses said step of extracting code of said hotspot functions reading the code from said application file (see, e.g., section 2.3, describing the role of the code generating loader in the optimization framework).

As per claim 12, *Kistler* further discloses said step of extracting the code of said hotspot functions reading the code from the memory when said application is loaded to the memory (see, e.g., section 2.3, describing the role of the code generating loader in the optimization framework).

As per claim 13, *Kistler* further discloses said step of changing the code producing a code that activates a secondary processing device to apply optimization on

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said extracted code, wherein the new generated code runs faster on the identified hardware (see, e.g., section 2.4, describing the optimizer subsystem; see also p. 61, paragraph 2, describing the use of a different CPU for re-optimization).

As per claim 16, *Kistler* further discloses said step of changing the flow of said application changing said application file (see, e.g., section 2.7, and in particular, p. 45, describing changing branches to old code to branches to the new code).

As per claim 17, *Kistler* further discloses said step of changing the flow of said application changing a memory after said application is loaded (see, e.g., section 2.7, and in particular, p. 45, describing changing branches to old code to branches to the new code; the new code is then loaded into memory upon execution instead of the old code).

As per claim 18, *Kistler* further discloses said step of changing the flow of said application using dynamically loadable modules (see, e.g., section 5.3).

As per claim 19, *Kistler* further discloses said step of changing the flow of said application linking the application with said new code (see, e.g., section 2.7, and in particular, p. 45, describing changing branches to old code to branches to the new code).

As per claim 20, *Kistler* further discloses said step of changing the flow of said application changing the code to jump to said new code (see, e.g., section 2.7, and in particular, p. 45, describing changing branches to old code to branches to the new code).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 6, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kistler*, as applied above to claim 1, and further in view of U.S. Patent No. 6,718,544 (Humphreys et al.).

As per claim 6, although *Kistler* fails to expressly disclose using human guidance to choose said functions to be accelerated, *Humphreys et al.* teaches such human-guided optimization (see, e.g., col. 4, lines 30-36). Therefore, it would have been obvious to one of ordinary skill in the computer art at the time the invention was made to incorporate such human-guide optimization as taught by *Humphreys et al.* into the profile-guided optimization of *Kistler*. One would be motivated to do so to gain the advantage of being able to incorporate user knowledge about whether a particular function is or is not speed critical into the optimization parameters.

As per claims 21 and 22, although *Kistler* fails to expressly disclose more than one version of changed codes being generated using different optimization parameters, and further comprising the step of selecting the best version including running the different code versions and selecting the fastest version, *Humphreys et al.* teaches an optimization solution space module that generates profile information based on "running" an application compiled using different optimization parameters (execution results are simulated, but the user has the option to actually build and execute any or all of the solutions (see, e.g., col. 4, lines 48-56)), allowing a user to select a solution that best meets their needs (such as speed) (see, e.g., col. 3, line 14, through col. 4, line 29). Therefore, it would have been obvious to one of ordinary skill in the computer art at the time the invention was made to modify the profile-based optimization of *Kistler* to

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include the solution space solver of *Humphrey*, in order to gain the advantage of automating the generation of a makefile to achieve results that most closely achieve the user's goals.

14. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Kistler*, as applied above to claim 1, and further in view of, "How to detect the CPU type of the computer the application is running on," 01/31/2002 [online], accessed 12/18/2006, retrieved from Internet <URL: <http://dn.codegear.com/article/28327>> (hereinafter *Borland*).

As per claim 8, although *Kistler* fails to expressly disclose applying tests on the CPU to identify the CPU, *Borland* teaches such a test for detecting CPU type (see, e.g., the code segment). Therefore, it would have been obvious to one of ordinary skill in the computer art at the time the invention was made to include such a test in order to know the CPU type, as required by the disclosure of *Kistler* to mitigate the "processor mismatch problem" (see, e.g., p. 17).

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

16. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric B. Kiss whose telephone number is (571) 272-3699. The Examiner can normally be reached on Tue. - Fri., 7:00 am - 4:30 pm. The Examiner can also be reached on alternate Mondays.

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If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Tuan Dam, can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature should be directed to the TC 2100 Group receptionist: 571-272-2100.



Eric B. Kiss
December 18, 2006